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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/755,440

01/13/2004

Naoyuki Maeda

WEN-0029

1091

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07/20/2006

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EXAMINER

JOHNSON III, HENRY M

ART UNIT

PAPER NUMBER

3739

DATE MAILED: 07/20/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/755,440

Applicant(s)

MAEDA ET AL.

Examiner

Henry M. Johnson, III

Art Unit

3739

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 May 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-3,5,8,9 and 13-18 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3,5,8,9 and 13-18 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 13 January 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

Request for Continued Examination

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 5/22/2006 has been entered.

Response to Arguments

Applicant's arguments filed 5/22/2006 have been fully considered but they are not persuasive. Knopp et al. teach moving a surgical optical irradiation system in three dimensions in response to movement of an eye. The applicant too, provides a moving unit to adjust the position of an irradiation unit in three dimensions. Both use image processing and means for the determination of a change in eye position. Knopp et al. uses the image processing to calculate the required adjustment using Cartesian coordinates, while the applicant uses calculations based on polar coordinates. No rotational or angular repositioning to correct for a change in the optical axis of an eye is cited and both position the irradiation unit over the center of a pupil with no disclosure of alignment of the irradiation axis with the optical axis. The choice of positional coordinate system is obvious to a skilled artisan.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

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Claims 1-3, 5, 8, 9 and 13-18 rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 1 and 8 are rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential elements, such omission amounting to a gap between the elements. See MPEP § 2172.01. The omitted elements are: means for determining positional displacement. The detection units pick up images from which positional displacement may be determined or calculated. An image processor does not imply in itself a means for providing positional information.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1-3, 5, 8, 9, 13-15 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 6,099,522 to Knopp et al. Knopp et al. disclose an apparatus

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for ophthalmic surgery including a laser (Fig. 10, # 87) with optics (Fig. 1, # 17) (irradiation optical system), a beam steering (moving unit/means) and aiming unit (Fig. 10, # 75), a three dimensional tracking system (Fig. 10, #'s 50, 51, 53 & 54) using imaging (position and inclination detection unit/means) and image processing to track a the limbus of an eye, the tracking unit (alignment detection unit/means and movement control unit/means) providing input for the steering and aiming of the laser (Col. 28, lines 45-67). For corneal refractive surgery, the limbus of the eye is disclosed as a landmark ideally suited for tracking motion (Col. 12, lines 50-55). The tracking subsystem of the invention serves two important purposes: it tracks and follows the movements of the patient's tissue--not only the voluntary movements which can be damped with specialized treatment, but also the involuntary movements which are more difficult to control on a living specimen, and continuously re-presents an image of the same section of tissue. Thus the surgeon/user is provided a continuous, substantially immobilized view of that tissue regardless of patient movements; and it further provides a fail-safe means for immediately stopping the action of the surgical laser beam in the event the tracking is lost (Col. 12, lines 5-16). The use of the limbus for tracking is disclosed using imaging techniques (Col. 20, lines 18-40). The continuous imaging implies a reference image to track motion thus requiring a storage capability to store the series of images. The three dimensional tracking is capable of detecting all eye movements. Knopp et al. teaches in the background (Bille – incorporated by reference) that marks can be placed on the eye for tracking (Col. 7, line 15), thus disclosing that marking of the eye is a known method for tracking movement. The comparison of successive images requires storage of the images and is interpreted as an alignment detection unit. The computer, which directly controls laser firing automatically interrupts the firing sequence should any of the required operational specifications not be met. The system is disclosed as tracking translation and/or rotational motion, this interpreted as

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including inclination. Knopp et al. does not teach the use of polar coordinates in the calculation of position based on the detected images. It would have been obvious to one skilled in the art to use polar coordinates as an alternative equivalent to Cartesian coordinates in the calculation of positional data as both are well known and commonly used for such purpose.

Claims 16 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 6,099,522 to Knopp et al. as applied to claims 1 and 8 above and further in view of U.S. Patent 5,865,832 to Knopp et al. Knopp et al. '522 is discussed above, but does not teach tracking using pupil position. Knopp et al. '832 teaches the pupil of the eye may also serve as a tracking mark. This despite the fact that the pupil may change its dimensions, since as long as the change is symmetrical and is not so fast as to exceed the response time of the sensors. While not as attractive as the limbus for tracking the cornea, using the pupil as a landmark is understood to fall within the domain of the present disclosure whenever pure contrast-based algorithms are utilized in the tracking (Col. 18, line 66 to Col. 19, line 10). It would have been obvious to one having ordinary skill in the art at the time the invention was made to use the pupil tracking as taught by Knopp et al. '832 in the apparatus of Knopp et al. '522 as an alternative to the limbus or markings on the eye for tracking eye movement. One of skill in the art would most certainly look to known inventions for tracking eye movement in the development of a new apparatus.

Conclusion

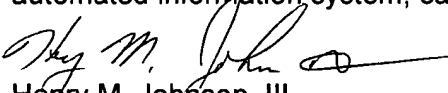
The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. U.S. Patents 6,702,806 and 7,044,602 use angular information in determination of position displacement, the latter also teaching the tracking of torsional orientation.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Henry M. Johnson, III whose telephone number is (571) 272-4768. The examiner can normally be reached on Monday through Friday from 6:00 AM to 3:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Linda C. Dvorak can be reached on (571) 272-4764. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.


Henry M. Johnson, III
Primary Examiner
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